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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/415,901	10/08/1999	NITIN VAIDYA	1018.051US1	5437

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LAW OFFICES OF MICHAEL DRYJA
704 228TH AVENUE NE
PMB 694
SAMMAMISH, WA 98074

EXAMINER
RYMAN, DANIEL J

ART UNIT	PAPER NUMBER
2665	

DATE MAILED: 03/05/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/415,901	VAIDYA ET AL.	
	Examiner	Art Unit	
	Daniel J. Ryman	2665	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *08 October 1999* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-27* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *9-11 and 25-27* is/are allowed.

6)☒ Claim(s) *1-4,6,8,12-20,22, and 24* is/are rejected.

7)☒ Claim(s) *5,7,21 and 23* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *08 October 1999* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *1* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Drawings

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: ref. 20 in Fig. 1 (see page 6, line 20); ref. 25 in Fig. 1 (see page 7, line 9); ref. 50 in Fig. 1 (see page 8, line 22). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

2. The disclosure is objected to because of the following informalities: on page 14, line 13 "time. , In" should be "time. In".

Appropriate correction is required.

3. The disclosure is objected to because the sentence, "It is reset only once," on page 12, line 20 is misleading. This sentence could be misconstrued as meaning that the clock is reset only once instead of that the clock is reset only once each time a packet is received. The examiner suggests changing the sentence to read "It is reset only once each time a packet is received."

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1-3, 8, 12-20, and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Reardon et al (USPN 5,636,223) in view of Tout et al (USPN 5,991,295).

6. Regarding claim 1, Reardon discloses a computer-implemented method for distributed fair scheduling (col. 3, lines 45-61) comprising: determining a back-off interval based on at least priority values of the packet (col. 6, lines 25-30 and col. 6, line 50-col. 7, line 12); counting from the back-off interval to a predetermined transmission time (col. 3, lines 56-61; col. 6, line 50-col. 7, line 12; and col. 7, line 60-col. 8, line 15); and, transmitting the packet upon counting from the back-off interval to the predetermined transmission time (col. 3, lines 56-61; col. 6, line 50-col. 7, line 12; and col. 7, line 60-col. 8, line 15). Reardon possibly does not expressly disclose tagging a packet with a start tag; however, it is well known in the art to use tags internal to a node in order to attach, to a packet, information needed for processing the packet within the node. For instance, Tout teaches using internal tags, within a switch, where a switch is a network device which uses scheduling, to ensure proper transmission of packets, (attach to a packet any information needed by the switch about a particular packet) (col. 1, lines 39-52). It would have been obvious to one of ordinary skill at the time of the invention to tag the packet with a start tag in order to attach to the packet its priority information which would subsequently be used to determine its back-off transmission time.

7. Regarding claim 2, referring to claim 1, Reardon in view of Tout does not expressly disclose determining whether a collision occurred between a packet and another packet; and upon determining that a collision occurred, determining a new back-off interval, and transmitting the packet upon counting from the new back-off interval to the new predetermined transmission time; however, such steps are implied. Reardon in view of Tout discloses determining whether a

channel is idle; if the channel is idle, transmitting the packet; and if the channel is not idle, determining another back-off period and transmitting the packet at the end of the back-off period (Reardon: col. 3, lines 56-61; col. 6, line 50-col. 7, line 12; and col. 7, line 60-col. 8, line 15). Since a collision is an unsuccessful attempt at transmission just as a busy channel is an unsuccessful attempt transmission, it would have been obvious to one of ordinary skill in the art at the time of the invention to determine if a collision occurred, and if a collision has occurred, to determine a new back-off interval and attempt transmission at the end of the back-off interval in order to ensure a successful transmission of the packet.

8. Regarding claim 3, referring to claim 1, Reardon in view of Tout discloses receiving the packet at a node for transmission therefrom (Reardon: col. 3, lines 56-61; col. 6, line 50-col. 7, line 12; and col. 7, line 60-col. 8, line 15).

9. Regarding claim 8, referring to claim 1, Reardon in view of Tout discloses that the predetermined transmission time comprises zero (Reardon: col. 7, lines 64-col. 8, line 6) where "time has expired" is taken to be that the "time comprises zero."

10. Regarding claim 12, Reardon discloses a computerized system comprising: a link through which packets are transmitted (col. 3, lines 49-61); and, a plurality of nodes (col. 3, lines 49-61), each node transmitting a packet through the link when a counting from a back-off interval for the packet reaches a predetermined transmission time (col. 3, line 49-col. 4, line 14; col. 6, line 50-col. 7, line 12; and col. 7, line 60-col. 8, line 15), wherein the back-off interval for each packet is based on a priority of the packet (col. 6, lines 25-30 and col. 6, line 50-col. 7, line 12). Reardon possibly does not expressly disclose tagging a packet with a start tag; however, it is well known in the art to use tags internal to a node in order to attach, to a packet, information needed for

processing the packet within the node. For instance, Tout teaches using internal tags, within a switch, where a switch is a network device which uses scheduling, to ensure proper transmission of packets (attach to a packet any information needed by the switch about a particular packet) (col. 1, lines 39-52). It would have been obvious to one of ordinary skill at the time of the invention to tag the packet with a start tag in order to attach to the packet its priority information which would subsequently be used to determine its back-off transmission time. Reardon in view of Tout does not expressly disclose that the back-off interval is based upon a virtual clock maintained by the node of the packet; however, Reardon in view of Tout suggests this since Reardon in view of Tout discloses having some sort of mechanism to keep track of the back-off time (Reardon: col. 7, lines 64-col. 8, line 6) and having the back-off interval varied according to a variety of parameters, with one of these parameters being number of channel access attempts (Reardon: col. 3, line 62-col. 4, line 28). Since the number of channel access attempts is based upon the number of times the virtual clock reaches zero, as broadly defined, the back-off interval is indirectly determined based upon the virtual clock with the virtual clock determining the number of channel access attempts and the number of channel access attempts helping to determine the priority of the packet.

11. Regarding claim 13, referring to claim 12, Reardon in view of Tout discloses that each node comprises a controller at which the packet for the node is received for transmission through the link (Reardon: col. 6, line 50-col. 8, line 15) where the apparatus performing the steps (steps 301, 303, etc.) is broadly defined as a controller.

12. Regarding claim 14, referring to claim 12, Reardon in view of Tout discloses that the predetermined transmission time comprises zero (Reardon: col. 7, lines 64-col. 8, line 6) where "time has expired" is taken to be that the "time comprises zero."

13. Regarding claim 15, Reardon discloses a computer (col. 3, lines 49-56) comprising: generating one or more packets for transmission through a link operatively coupled to the computer (col. 3, lines 49-56) where it is well-known in the art to have a computer transmit packets generated by an application; and, a controller to receive each packet (col. 6, line 50-col. 8, line 15) where the apparatus performing the steps (steps 301, 303, etc.) is broadly defined as a controller, and to transmit each packet through the link when a counting from a back-off interval reaches a predetermined transmission time (col. 7, line 60-col. 8, line 10), wherein the back-off interval for each packet is based on a priority of the packet (col. 6, lines 25-30 and col. 6, line 50-col. 7, line 12). Reardon possibly does not expressly disclose tagging a packet with a start tag; however, it is well known in the art to use tags internal to a node in order to attach, to a packet, information needed for processing the packet within the node. For instance, Tout teaches using internal tags, within a switch, where a switch is a network device which uses scheduling, to ensure proper transmission of packets (attach to a packet any information needed by the switch about a particular packet) (col. 1, lines 39-52). It would have been obvious to one of ordinary skill at the time of the invention to tag the packet with a start tag in order to attach to the packet its priority information which would subsequently be used to determine its back-off transmission time. Reardon in view of Tout does not expressly disclose that the back-off interval is based upon a virtual clock maintained by the controller; however, Reardon in view of Tout suggests this since Reardon in view of Tout discloses having some sort of mechanism to keep track of the

back-off time (Reardon: col. 7, lines 64-col. 8, line 6) and having the back-off interval varied according to a variety of parameters, with one of these parameters being number of channel access attempts (Reardon: col. 3, line 62-col. 4, line 28). Since the number of channel access attempts is based upon the number of times the virtual clock reaches zero, as broadly defined, the back-off interval is indirectly determined based upon the virtual clock with the virtual clock determining the number of channel access attempts and the number of channel access attempts helping to determine the priority of the packet.

14. Regarding claim 16, referring to claim 15, Reardon in view of Tout discloses that the predetermined transmission time comprises zero (Reardon: col. 7, lines 64-col. 8, line 6) where "time has expired" is taken to be that the "time comprises zero."

15. Regarding claim 17, Reardon discloses a computer-implemented method for distributed fair scheduling (col. 3, lines 45-61) comprising: determining a back-off interval based on at least priority values of the packet (col. 6, lines 25-30 and col. 6, line 50-col. 7, line 12); counting from the back-off interval to a predetermined transmission time (col. 3, lines 56-61; col. 6, line 50-col. 7, line 12; and col. 7, line 60-col. 8, line 15); and, transmitting the packet upon counting from the back-off interval to the predetermined transmission time (col. 3, lines 56-61; col. 6, line 50-col. 7, line 12; and col. 7, line 60-col. 8, line 15). Reardon possibly does not expressly disclose tagging a packet with a start tag; however, it is well known in the art to use tags internal to a node in order to attach, to a packet, information needed for processing the packet within the node. For instance, Tout teaches using internal tags, within a switch, where a switch is a network device which uses scheduling, to ensure proper transmission of packets (attach to a packet any information needed by the switch about a particular packet) (col. 1, lines 39-52). It would have

been obvious to one of ordinary skill at the time of the invention to tag the packet with a start tag in order to attach to the packet its priority information which would subsequently be used to determine its back-off transmission time. While Reardon in view of Tout does not expressly disclose that this process is implemented on a machine-readable medium having instructions stored thereon for execution by a processor, it is well-known in the art to implement methods using machine-readable instructions for execution by a processor since computer code is much more flexible than hardware, owing to the ease with which computer code can be changed relative to hardware, and processors are well-known and flexible devices with which to implement computer code.

16. Regarding claim 18, referring to claim 17, Reardon in view of Tout does not expressly disclose determining whether a collision occurred between a packet and another packet; and upon determining that a collision occurred, determining a new back-off interval, and transmitting the packet upon counting from the new back-off interval to the new predetermined transmission time; however, such steps are implied. Reardon in view of Tout discloses determining whether a channel is idle; if the channel is idle, transmitting the packet; and if the channel is not idle, determining another back-off period and transmitting the packet at the end of the back-off period (Reardon: col. 3, lines 56-61; col. 6, line 50-col. 7, line 12; and col. 7, line 60-col. 8, line 15). Since a collision is an unsuccessful attempt at transmission just as a busy channel is an unsuccessful attempt transmission, it would have been obvious to one of ordinary skill in the art at the time of the invention to determine if a collision occurred, and if a collision has occurred, to determine a new back-off interval and attempt transmission at the end of the back-off interval in order to ensure a successful transmission of the packet.

17. Regarding claim 19, referring to claim 17, Reardon in view of Tout discloses receiving the packet at a node for transmission therefrom (Reardon: col. 3, lines 56-61; col. 6, line 50-col. 7, line 12; and col. 7, line 60-col. 8, line 15).

18. Regarding claim 24, referring to claim 17, Reardon in view of Tout discloses that the predetermined transmission time comprises zero (Reardon: col. 7, lines 64-col. 8, line 6) where "time has expired" is taken to be that the "time comprises zero."

19. Claims 4, 6, 20, and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Reardon et al (USPN 5,636,223) in view of Tout et al (USPN 5,991,295) as applied to claims 1 and 17 above, and further in view of Limb (USPN 4,412,326).

20. Regarding claim 4, referring to claim 1, Reardon in view of Tout does not expressly disclose resetting a virtual clock; however, Reardon in view of Tout suggests this since Reardon in view of Tout discloses having some sort of mechanism to keep track of the back-off time (Reardon: col. 7, lines 64-col. 8, line 6). Limb discloses, in an apparatus for avoiding packet collisions, having a timer reset upon the arrival of a packet (col. 10, lines 56-62) where resetting the clock is equivalent to loading the clock with a predetermined time. It would have been obvious to one of ordinary skill in the art at the time of the invention to reset a virtual clock in order to have the virtual clock be cable of keeping track of the back-off time such that the packet can be transmitted at the proper time.

21. Regarding claim 6, referring to claim 4, as broadly defined, Reardon in view of Tout in further view of Limb discloses that determining a back-off interval comprises determining the back-off interval based on also the virtual clock. Reardon in view of Tout in further view of Limb discloses that the back-off interval can be varied according to a variety of parameters, with

one of these parameters being number of channel access attempts (Reardon: col. 3, line 62-col. 4, line 28). Since the number of channel access attempts is based upon the number of times the virtual clock reaches back-off interval expires, as broadly defined, the back-off interval is indirectly determined based upon the virtual clock.

22. Regarding claim 20, referring to claim 17, Reardon in view of Tout does not expressly disclose resetting a virtual clock; however, Reardon in view of Tout suggests this since Reardon in view of Tout discloses having some sort of mechanism to keep track of the back-off time (Reardon: col. 7, lines 64-col. 8, line 6). Limb discloses, in an apparatus for avoiding packet collisions, having a timer reset upon the arrival of a packet (col. 10, lines 56-62) where resetting the clock is equivalent to loading the clock with a predetermined time. It would have been obvious to one of ordinary skill in the art at the time of the invention to reset a virtual clock in order to have the virtual clock be cable of keeping track of the back-off time such that the packet can be transmitted at the proper time.

23. Regarding claim 22, referring to claim 20, as broadly defined, Reardon in view of Tout in further view of Limb discloses that determining a back-off interval comprises determining the back-off interval based on also the virtual clock. Reardon in view of Tout in further view of Limb discloses that the back-off interval can be varied according to a variety of parameters, with one of these parameters being number of channel access attempts (Reardon: col. 3, line 62-col. 4, line 28). Since the number of channel access attempts is based upon the number of times the virtual clock reaches back-off interval expires, as broadly defined, the back-off interval is indirectly determined based upon the virtual clock.

Allowable Subject Matter

24. Claims 5 and 21 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Claims 5 and 21 disclose that the virtual clock is updated to be the value of the start tag when the start tag exceeds the value of the virtual clock. Reardon in view of Tout in further view of Limb discloses updating the value of the virtual clock and having a start tag, which is a priority value, that is used to determine a back-off interval. Since the start tag is a priority value and not a time value, it would not be obvious to update the clock to reflect the value of the start tag. However, updating the virtual clock to the start tag of the packet upon determining that the start tag exceeds the virtual clock would be an obvious thing to do, if the start tag were the back-off interval for the packet. If the virtual clock, which is responsible for keeping track of the time to transmission, and the back-off interval do not match, such that the clock is set to a value less than the back-off interval, then the clock will reach zero and transmission will take place before it is supposed to occur. In order to remedy this situation, it would have been obvious to one of ordinary skill in the art at the time of the invention to update the virtual clock to the back-off interval of the packet upon determining that these two values do not match in order to ensure that the transmission of the packet does not occur before the end of the back-off interval.

25. Claims 7 and 23 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Claims 7 and 23 disclose that the start tag determined as the greater of a virtual clock and a finish tag of a previous packet. The wording of this claim implies that the

start tag contains a time value since the start tag is the greater of a clock (time value) and a finish tag (implied to be a time value since a comparison with a time value is only valid if the finish tag is also a time value). Reardon in view of Tout in further view of Limb discloses a start tag value which is a priority value. Since Reardon in view of Tout in further view of Limb disclose a priority value, and not a time value, for the start tag, it would not be obvious to make the start tag a time value.

26. Claims 9-11 and 25-27 are allowed. Claims 9 and 25 disclose that the start tag determined as the greater of a virtual clock and a finish tag of a previous packet. The wording of this claim implies that the start tag contains a time value since the start tag is the greater of a clock (time value) and a finish tag (implied to be a time value since a comparison with a time value is only valid if the finish tag is also a time value). Reardon in view of Tout in further view of Limb discloses a start tag value which is a priority value. Since Reardon in view of Tout in further view of Limb disclose a priority value, and not a time value, for the start tag, it would not be obvious to make the start tag a time value.

Conclusion

27. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Kuddes et al (USPN 5,353,287). Kobayashi (USPN 5,402,420). King et al (USPN 6,320,858). Jandrell (USPN 6,459,704). Kobayashi et al (UPSN 3,878,512). Sadamori (UPSN 5,311,172). Shaver (USPN 4,561,092).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daniel J. Ryman whose telephone number is (703)305-6970. The examiner can normally be reached on Mon.-Fri. 7:00-5:00 with every other Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Huy Vu can be reached on (703)308-6602. The fax phone numbers for the organization where this application or proceeding is assigned are (703)308-6743 for regular communications and (703)308-9051 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)305-3900.

Daniel J. Ryman
Examiner
Art Unit 2665

DJR2

Daniel J. Ryman
February 28, 2003

HUY D. VU
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600